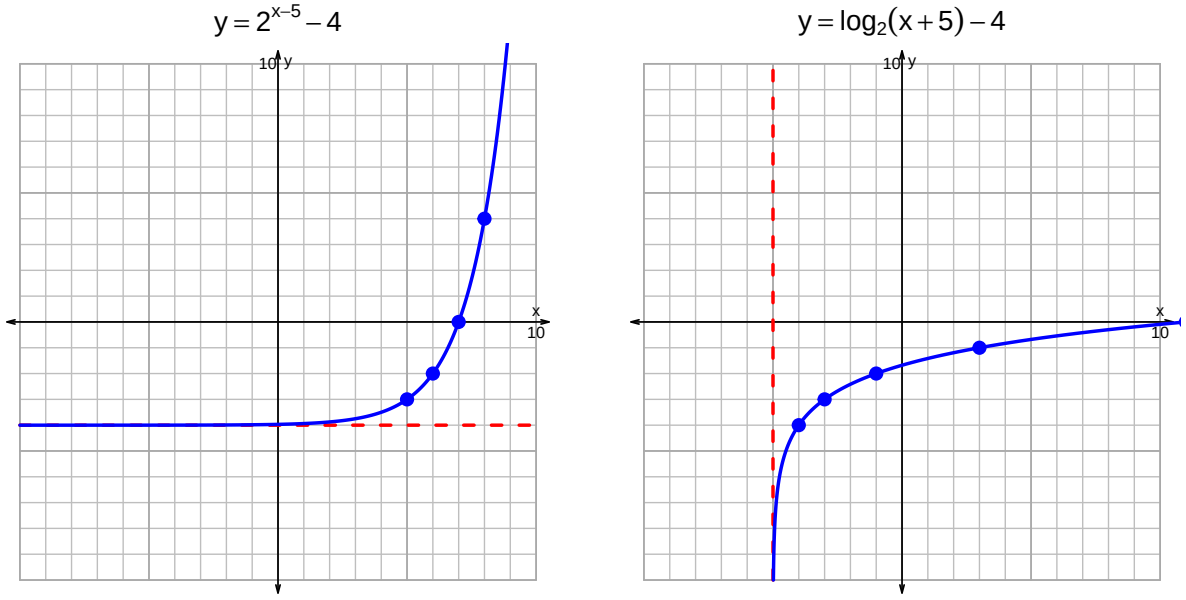
Name: Date:

s18quiz: EXP LOG (Solution v137)

1. Graph $y = 2^{x-5} - 4$ and $y = \log_2(x+5) - 4$ on the grids below. Also, draw any asymptotes with dotted lines.



2. Write (but do not evaluate) the solution to the equation below by writing a logarithmic expression.

$$-23 = \left(\frac{-5}{7}\right) \cdot 10^{4t/3}$$

Divide both sides by $\frac{-5}{7}$.

$$\frac{23 \cdot 7}{5} = 10^{4t/3}$$

Take log, base 10, of both sides.

$$\log_{10}\left(\frac{23 \cdot 7}{5}\right) = \frac{4t}{3}$$

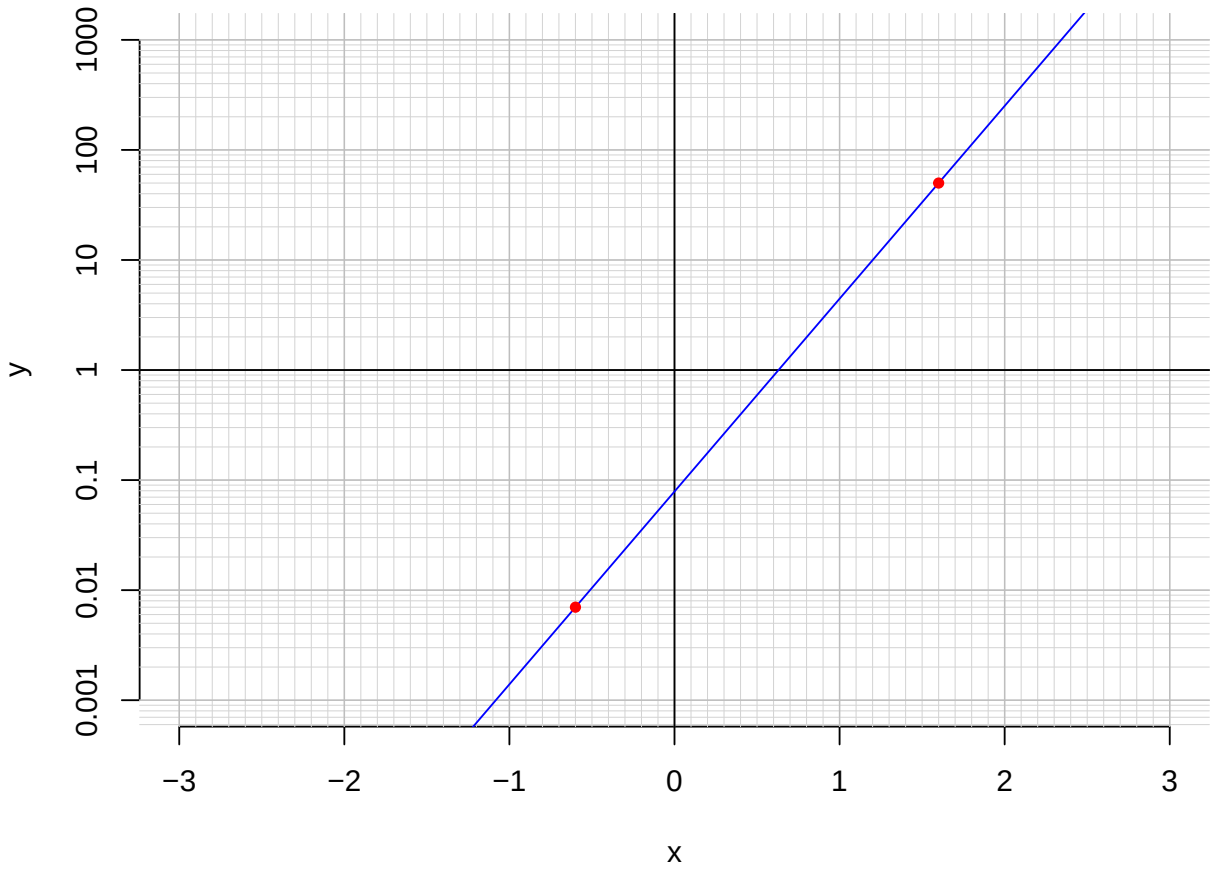
Divide both sides by $\frac{4}{3}$.

$$\frac{3}{4} \cdot \log_{10}\left(\frac{23 \cdot 7}{5}\right) = t$$

Switch sides.

$$t = \frac{3}{4} \cdot \log_{10}\left(\frac{23 \cdot 7}{5}\right)$$

3. An exponential function $f(x) = 0.0787 \cdot e^{4.03x}$ is graphed below on a semi-log plot.



a. Using the plot above, evaluate $f(-0.6)$.

$$f(-0.6) = 0.007$$

b. Express $f^{-1}(x)$, the inverse of f.

$$f^{-1}(x) = \frac{1}{4.03} \cdot \ln\left(\frac{x}{0.0787}\right)$$

c. Using the plot above, evaluate $f^{-1}(50)$.

$$f^{-1}(50) = 1.6$$